AMENDMENTS TO CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

A1
B1

1. (Currently Amended) An optimal high-speed multi-resolution retrieval method on a large capacity database comprising the steps of:

deriving the multi-resolution structure of a query "Q";

setting an initial minimum distance "d_{min}" to have the infinite value[[.]];

setting respective values of "i" and "l" to be "1"[[.]];

deriving "$d^l(X_i, Q)$", where $d^l(X_i, Q)$ is a distance between a histogram X_i and query Q at a level l;

deriving "$d^L(X_i, Q)$", where $d^L(X_i, Q)$ is a distance between a histogram X_i and query Q at a level L;

based on results of the steps of deriving d^l and d^L, obtaining a final value of "d_{min}"; and

selecting data having ~~a~~ the final value of "d_{min}" as the best match.

2. (Original) The optimal high-speed multi-resolution retrieval method according to claim 1, wherein the step of deriving "$d^l(X_i, Q)$" comprises the steps of:

if "$d^l(X_i, Q)$" is more than "d_{min}", then removing the current candidate "X_i", and updating respective values of "i" and "l" with "i + 1" and "1"; and

if "$d^l(X_i, Q)$" is not more than "d_{min}", then updating "l " with "i + 1".

3. (Original) The optimal high-speed multi-resolution retrieval method according to claim 1, wherein the step of deriving "$d^L(X_i, Q)$" comprises the steps of:

if "$d^L(X_i, Q)$" is more than "d_{min}", then removing the current candidate "X_i"; and

if "$d^L(X_i , Q)$" is not more than "d_{min}", then updating "d_{min}" with "$d^L(X_i , Q)$", and updating respective values of "i" and "*1*" with "i + 1" and "1".

4. (Currently Amended) The optimal high-speed multi-resolution retrieval method according to claim 1, wherein the high-speed multi-resolution retrieval on the database is carried out using an inequality property expressed by the following expression:

$$d(X,Y) \equiv d^{L}(X,Y) \geq d^{L-1}(X,y) \geq \cdots \geq d^{l}(X,Y) \geq \cdots \geq d^{l}(X,Y) \geq d^{0}(X,Y).$$

5. (Currently Amended) An optimal high-speed multi-resolution retrieval method using a cluster-based multi-resolution search algorithm adapted to output one best match, comprising the steps of:

performing a high-speed multi-resolution exhaustive search algorithm, thereby searching for a cluster "k_{min}" having a minimum distance "d'_{min}";

setting an initial value of the "d_{min}" to "d'_{min}", applying the high-speed multi-resolution exhaustive search algorithm to "$\Phi_{k\,min}$", thereby updating "d_{min}";

deriving "$d^{l_k}(C_k, Q) - \delta_k$"; and

selecting data having a final value of "d_{min}" ~~is selected~~ as the best match.

6. (Currently Amended) The optimal high-speed multi-resolution retrieval method according to claim 5, wherein the high-speed multi-resolution retrieval using the cluster-based multi-resolution search algorithm is carried out using an inequality property expressed by the following expression:

If $d^{l_k}(C_k, Q) - \delta_k > d_{min}$, then $X_i^{min} \in \Phi_k d(X_i, Q) > d_{min}$

where, $l_k \leq L$.

7. (Original) The optimal high-speed multi-resolution retrieval method according to claim 5, wherein "d_{min}" is updated with a value expressed by the following expression:

$$d_{min} = X_i^{min} \in \Phi_{k_{min}} d^L(X_i, Q),$$

At B1

Further comprising the steps of:

setting "k" to "1"; and

if $k = k_{min}$, updating "k" with "k + 1".

8. (Original) The optimal high-speed multi-resolution retrieval method according to claim 5 or 6, further comprising:

if "$d^{l_k}(C_k, Q) - \delta_k$" is more than "$d_{min}$", removing the cluster "k";

if " $d^{l_k}(C_k, Q) - \delta_k > d_{min}$ " is not more than "d_{min}", applying the high-speed multi-resolution exhaustive search algorithm to "Φ_k", thereby updating "d_{min}"; and

updating "k" with "k + 1".

9. (Original) An optimal high-speed multi-resolution retrieval method using a cluster-based multi-resolution search algorithm adapted to output a plurality of more-significant best matches, comprising the steps of:

performing a high-speed multi-resolution exhaustive search algorithm, thereby searching for a cluster "k_{min}" having a minimum distance "d'_{min}";

if $n(\Phi_{k_{min}}) \geq M$, searching for M more-significant best matches in accordance with an algorithm modified from the high-speed multi-resolution exhaustive search algorithm to search for the M more-significant best matches, and storing respective distance values of the searched more-significant best matches "$d_{min}[\cdot]$";

setting "k" to "1", and if $k = k_{min}$, updating "k" with "k + 1";

if $d^{l_k}(C_k, Q) - \delta_k > d_{min}[0]$, removing the cluster "k", and updating "k" with "d + 1";

setting "k" to "1", and if it is determined that the cluster "k" has been searched for, updating "k" with "k + 1";

if $d^{l_k}(C_k, Q) - \delta_k > d_{min}[M - 1]$, removing the cluster "k", and updating "k" with "d + 1";

updating "$d_{min}[\cdot]$" while applying the modified high-speed multi-resolution exhaustive search algorithm to "Φ_k", and updating "k" with "k + 1"; and

selecting M data corresponding to a final "$d_{\min}[\cdot]$" as best matches, respectively.

10. (Currently Amended) The optimal high-speed multi-resolution retrieval method according to claim 9, wherein the high-speed multi-resolution retrieval using the cluster-based multi-resolution search algorithm is carried out using an inequality property expressed by the following expression:

If $d^{l_k}(C_k,Q)-\delta_k > d_{\min}[M-1]$, then $X_i^{\min} \in \Phi_k d(X_i,Q) > d_{\min}[M-1]$.

11. (Original) The optimal high-speed multi-resolution retrieval method according to claim 9, further comprising:

if n ($\Phi_{k_{\min}}$) < M, filling if n ($\Phi_{k_{\min}}$) distance values in "$d_{\min}[\cdot]$" in the order of higher values, starting from the lowest value, and storing the remaining elements of "$d_{\min}[\cdot]$" with the infinite value.